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AND SOUND VOLUME ADJUSTMENT METHOD THEREOF
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Sir:

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Enclosed are:

- [X] Specification, Claim(s), and Abstract (33 pages).
- [X] Formal drawings (3 sheets, Figures 1-3).
- [X] Declaration and Power of Attorney (2 pages).
- [X] Claim for Convention Priority with 1 document.
- [X] Assignment of the invention to NEC CORPORATION.
- [X] Assignment Recordation Cover Sheet.
- [X] Information Disclosure Statement.
- [X] Form PTO-1449 with copies of 1 listed reference.

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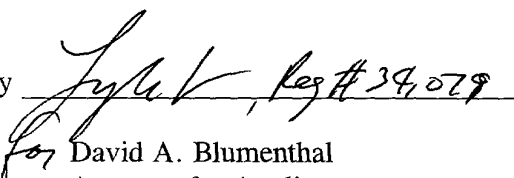
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SOUND VOLUME ADJUSTMENT SYSTEM IN PERSONAL COMPUTER AND
SOUND VOLUME ADJUSTMENT METHOD THEREOF

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

The present invention relates to a sound volume adjustment system in a personal computer and, more particularly, to a sound volume adjustment system enabling voice data to be reproduced in a level sound volume appropriated for each application and a sound volume adjustment method thereof.

DESCRIPTION OF THE RELATED ART

First, one example of sound volume adjustment in a conventional personal computer will be described with reference to Fig. 3.

Fig. 3 is a functional block diagram for use in explaining an arrangement of sound volume adjustment in a conventional personal computer. In multi-task environments, for example, voice data is transferred from a plurality of applications 320 and 321 to an operating system (e.g. Windows 98 (Registered Trademark)) as illustrated in Fig. 3. Then, an operating system 300 reproduces the voice data by the sound function. A sound volume of the reproduced sound is adjusted by a volume adjustment function 310.

The sound function of a personal computer has not only a function of reproducing voice data from an

application but also a function of generating a warning sound for use in notifying the occurrence of error etc. by an operating system.

5 In a conventional personal computer, however, a sound volume of a reproduced sound of voice data and a sound volume of a warning sound are adjusted in the lump by the common volume adjustment function (e.g. analog volume) 310. Change of the volume of the reproduced sound of voice data will therefore result in change of
10 the sound volume of the warning sound as well.

As a result, in a conventional personal computer, when an error occurs while voice data from an application is reproduced with its sound volume increased, a large volume of warning sound will be
15 generated. To the contrary, when an error occurs while voice data is reproduced with its volume decreased, a user might not notice the warning sound.

Under these circumstances, a technique of individually adjusting a sound volume of a warning sound
20 (buzzer sound) and a volume of a reproduced sound of voice data is proposed in Japanese Patent Laid-Open Kokai No. (Heisei) 10-31578 (Literature 1). According to the art disclosed in Literature 1, separately provided in addition to an analog volume are a sound volume
25 adjustment unit for adjusting a volume of a reproduced sound of voice data and a buzzer sound volume adjustment unit for adjusting a volume of a warning sound.

The above-described technique disclosed in Literature 1 has an advantage in realizing individual adjustment of a volume of a reproduced sound of voice data and a volume of a warning sound.

5 The conventional art, however, needs adjustment of the sound volume adjustment unit and the buzzer sound volume adjustment unit in addition to an analog volume, so that operation for sound volume adjustment might be complicated, which leaves a room for technical
10 improvement.

 In a multi-task environment, for example, voice data is transferred from a plurality of applications to an operating system as describe above. These voice data is ordinarily transferred as pulse coded modulation
15 (PCM) data. For such PCM data, a volume of its reproduced sound is roughly classified into two.

 That is, the first reproduced sound volume is a sound volume adjusted for a player as a domestic appliance. Among examples of volumes to be thus adjusted
20 are a sound volume of reproduced voice data of a CD (Compact Disk) and a sound volume of reproduced voice data of a DVD (Digital Video Disk).

 Second reproduced sound volume is that of voice data assumed to be handled as an application of a
25 personal computer. Sound volume in this case is adjusted to have the same level as that of a volume of a warning sound of the personal computer.

Thus, even in a case where volumes of reproduced sounds of voice data from applications are adjusted in the lump independently of a volume of a warning sound, the volumes of the reproduced sounds might vary with applications, so that there might arise a need of adjusting a sound volume for each application.

SUMMARY OF THE INVENTION

The present invention, intended to solve the above problems, aims at providing a personal computer enabling voice data to be reproduced in a level sound volume appropriate for each application and requiring easy sound volume adjustment operation and a sound volume adjustment method thereof, and a recording medium which records a program for making the computer to execute the sound volume adjustment processing therefor.

According to the first aspect of the invention, a sound volume adjustment system for a personal computer, comprises

a memory in which sound volume setting information set for each application is registered, and sound volume adjustment control means for adjusting, for each application, sound volume data of voice data transferred from the application to an operating system based on the sound volume setting information to generate sound volume data having been adjusted and transferring the sound volume data having

been adjusted to the operating system.

Thus registering an application and sound volume setting information correlated to each other and automatically adjusting sound volume data based on the sound volume setting information eliminates the user's need of adjusting a sound volume for each application. The present invention therefore realizes a personal computer enabling voice data to be reproduced in a level sound volume appropriate for each application and requiring easy sound volume adjustment operation.

In the preferred construction, in the memory a sound volume adjustment coefficient is stored as the sound volume setting information, and the sound volume adjustment control means multiplies the sound volume data by the sound volume adjustment coefficient to generate the sound volume data having been adjusted.

Thus, by generating sound volume data having been adjusted by multiplying sound volume data by a sound volume adjustment coefficient, a sound volume can be adjusted with ease.

In another preferred construction, a sound volume level of the sound volume data having been adjusted is set to be equivalent to that of a sound volume of a system sound (error sound) generated by the operating system.

As described in the foregoing, adjusting the level of a sound volume of sound volume data having been

adjusted to the level of a sound volume of an error sound allows a sound volume of a reproduced sound of voice data from an application to equal a sound volume of a warning sound. As a result, it is possible to prevent such a situation that a warning sound is too loud or too weak for a volume of a reproduced sound of voice data.

In another preferred construction, in the memory a sound volume adjustment coefficient is stored as the sound volume setting information, the sound volume adjustment control means multiplies the sound volume data by the sound volume adjustment coefficient to generate the sound volume data having been adjusted, and a sound volume level of the sound volume data having been adjusted is set to be equivalent to that of a sound volume of a system sound (error sound) generated by the operating system.

In another preferred construction, when voice data is transferred from an application for which sound volume setting information is yet to be registered, the sound volume adjustment control means displays sound volume adjustment function indications on an operation screen to register, in the memory, sound volume setting information based on a sound volume set by the operation through the sound volume adjustment function indications so as to correspond to the application.

By a manner as described in the foregoing, even

with respect to voice data from an application yet to be registered in a memory, it is possible to appropriately adjust a sound volume, as well as registering sound volume setting information thereof. As a result, when voice data is transferred from the application again, a sound volume can be automatically adjusted based on the registered sound volume setting information.

In another preferred construction, in the memory a sound volume adjustment coefficient is stored as the sound volume setting information, the sound volume adjustment control means multiplies the sound volume data by the sound volume adjustment coefficient to generate the sound volume data having been adjusted, and when voice data is transferred from an application for which sound volume setting information is yet to be registered, the sound volume adjustment control means displays sound volume adjustment function indications on an operation screen to register, in the memory, sound volume setting information based on a sound volume set by the operation through the sound volume adjustment function indications so as to correspond to the application.

In another preferred construction, a sound volume level of the sound volume data having been adjusted is set to be equivalent to that of a sound volume of a system sound (error sound) generated by the operating system, and when voice data is transferred from an

application for which sound volume setting information is yet to be registered, the sound volume adjustment control means displays sound volume adjustment function indications on an operation screen to register, in the memory, sound volume setting information based on a sound volume set by the operation through the sound volume adjustment function indications so as to correspond to the application.

In another preferred construction, in the memory a sound volume adjustment coefficient is stored as the sound volume setting information, the sound volume adjustment control means multiplies the sound volume data by the sound volume adjustment coefficient to generate the sound volume data having been adjusted, a sound volume level of the sound volume data having been adjusted is set to be equivalent to that of a sound volume of a system sound (error sound) generated by the operating system, when voice data is transferred from an application for which sound volume setting information is yet to be registered, the sound volume adjustment control means displays sound volume adjustment function indications on an operation screen to register, in the memory, sound volume setting information based on a sound volume set by the operation through the sound volume adjustment function indications so as to correspond to the application.

According to the second aspect of the invention,

a sound volume adjustment method for a personal computer,
comprising the steps of

registering sound volume setting information set
for each application,

5 adjusting, for each application, sound volume
data of voice data transferred from the application to
an operating system based on the sound volume setting
information to generate sound volume data having been
adjusted, and

10 transferring the sound volume data having been
adjusted to the operating system.

In the preferred construction, a sound volume
adjustment coefficient is registered as the sound volume
setting information, and the sound volume data is
15 multiplied by the sound volume adjustment coefficient to
generate the sound volume data having been adjusted.

In another preferred construction, a sound volume
level of the sound volume data having been adjusted is
set to be equivalent to that of a sound volume of a
20 system sound (error sound) generated by the operating
system.

In another preferred construction, a sound volume
adjustment coefficient is stored as the sound volume
setting information, the sound volume data is multiplied
25 by the sound volume adjustment coefficient to generate
the sound volume data having been adjusted, and a sound
volume level of the sound volume data having been

adjusted is set to be equivalent to that of a sound volume of a system sound (error sound) generated by the operating system.

5 In another preferred construction, when voice data is transferred from an application for which sound volume setting information is yet to be registered, sound volume setting information based on a set sound volume is registered in the memory so as to correspond to the application.

10 In another preferred construction, a sound volume adjustment coefficient is stored as the sound volume setting information, the sound volume data is multiplied by the sound volume adjustment coefficient to generate the sound volume data having been adjusted, and when
15 voice data is transferred from an application for which sound volume setting information is yet to be registered, sound volume setting information based on a set sound volume is registered in the memory so as to correspond to the application.

20 In another preferred construction, a sound volume level of the sound volume data having been adjusted is set to be equivalent to that of a sound volume of a system sound (error sound) generated by the operating system, and when voice data is transferred from an
25 application for which sound volume setting information is yet to be registered, sound volume setting information based on a set sound volume is registered in

the memory so as to correspond to the application.

In another preferred construction, a sound volume adjustment coefficient is stored as the sound volume setting information, the sound volume data is multiplied
5 by the sound volume adjustment coefficient to generate the sound volume data having been adjusted, a sound volume level of the sound volume data having been adjusted is set to be equivalent to that of a sound volume of a system sound (error sound) generated by the
10 operating system, and when voice data is transferred from an application for which sound volume setting information is yet to be registered, sound volume setting information based on a set sound volume is registered in the memory so as to correspond to the
15 application.

According to another aspect of the invention, a computer readable memory storing a sound volume adjustment program for controlling a personal computer to conduct sound volume adjustment,

20 the sound volume adjustment program comprising the steps of

registering sound volume setting information set for each application,

adjusting, for each application, sound volume
25 data of voice data transferred from the application to an operating system based on the sound volume setting information to generate sound volume data having been

adjusted, and

transferring the sound volume data having been adjusted to the operating system.

Other objects, features and advantages of the present invention will become clear from the detailed description given herebelow.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be understood more fully from the detailed description given herebelow and from the accompanying drawings of the preferred embodiment of the invention, which, however, should not be taken to be limitative to the invention, but are for explanation and understanding only.

In the drawings:

Fig. 1 is a functional block diagram for use in explaining a structure of a personal computer according to one embodiment of the present invention;

Fig. 2 is a flow chart for use in explaining a personal computer sound volume adjustment method according to the present embodiment of the present invention;

Fig. 3 is a functional block diagram for use in explaining a structure of a conventional personal computer.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiment of the present invention will be discussed hereinafter in detail with reference to the accompanying drawings. In the following description, numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will be obvious, however, to those skilled in the art that the present invention may be practiced without these specific details. In other instance, well-known structures are not shown in detail in order to unnecessary obscure the present invention.

It is assumed that the following personal computer sound volume adjustment processing according to the present embodiment is executed by a computer controlled by a program. The program is presented, for example, by a recording medium. Used as the recording medium may be, for example, a magnetic disk, a semiconductor memory or other arbitrary medium which can be read by a computer.

First with reference to Fig. 1, sound volume adjustment in a personal computer according to the present embodiment will be described. In the figure, illustration is made only of a part of the structure related to sound volume adjustment of the personal computer and that of the remaining part is omitted for the sake of explanation.

Fig. 1 is a functional block diagram for use in explaining the structure related to sound volume

adjustment of the personal computer according to the present embodiment. In the present embodiment, as well as the conventional art, voice data is transferred from each of a plurality of applications 120 and 121 to an operating system 100.

Also in the present embodiment similarly to the conventional art, the operating system 100 is provided with a volume adjustment function 110. The volume adjustment function 110 is realized, for example, as an analog volume.

Then, in the present embodiment, sound volume setting information set in advance for each application is registered in a memory 140. Here, a sound volume adjustment coefficient is stored as the sound volume setting information. The sound volume setting information is set such that a sound volume level of sound volume data having been adjusted is equivalent (e.g. the level is set to "1") to that of an error sound or the like generated by the operating system.

In a case, for example, of an application premised on that voice data is handled as an application of the personal computer, its sound volume data is originally set to have the same level of a sound volume as that of a warning sound of the personal computer. Therefore, stored as a sound volume adjustment coefficient corresponding to such an application is "1" indicating that the level is the same as the sound

volume level of the warning sound of the personal computer.

Also in a case, for example, where the application is a CD or a DVD, its sound volume data has its sound volume adjusted for a player as a domestic appliance. It is therefore necessary to adjust a volume of a sound which is reproduced based on voice data having been adjusted by multiplying a sound volume level of sound volume data by a predetermined sound volume adjustment coefficient.

In such a case, if a sound volume of the sound volume data is originally set to be smaller than that of the warning sound, the sound volume coefficient may be set to have a value larger than "1" in order to increase a volume of a sound reproduced based on the sound volume data having been adjusted up to a level equivalent to that of the warning sound.

On the other hand, when the sound volume of the sound volume data is originally set to be larger than that of the warning sound, the sound volume coefficient may be set to have a value smaller than "1" in order to decrease the reproduced sound volume based on the sound volume data having been adjusted down to a level equivalent to that of the warning sound.

Then, the personal computer of the present embodiment is provided with a sound volume adjustment control unit 130. The sound volume adjustment control

unit 130 adjusts, for each application, sound volume data of voice data transferred from the applications 120 and 121 to the operating system 100 based on the sound volume setting information stored in the memory 140 to generate sound volume data having been adjusted.

Here, the sound volume adjustment control unit 130, at the generation of sound volume data having been adjusted, reads a sound volume adjustment coefficient corresponding to the application from among the sound volume setting information stored in the memory 140. Then, the unit 130 multiplies the sound volume data in the application by the sound volume adjustment coefficient to generate sound volume data having been adjusted.

Then, the sound volume adjustment control unit 130 transfers the sound volume data having been adjusted to the operating system. Therefore, a reproduced sound volume of the voice data is leveled approximately to that of the warning sound irrespective of an application. As a result, a user is allowed to reproduce voice data in a desired sound volume irrespective of an application only by adjusting a sound volume by means of the volume adjustment function 110. The user accordingly needs no adjustment of a sound volume for each application.

The foregoing arrangement enables the present embodiment to reproduce voice data in a level sound volume appropriate for each application and realize a

personal computer whose sound volume adjustment is easy.

The sound volume adjustment control unit 130 displays sound volume adjustment function indications on an operation screen 150. When the application is yet to be registered, the sound volume adjustment control unit 130 displays the sound volume adjustment function indication on the operation screen 150. Then, through the user's operation of the sound volume adjustment function indication, sound volume setting information corresponding to a new application, that is, a sound volume adjustment coefficient, is set at the memory 140.

Next, with reference to Fig. 2, description will be made of a personal computer sound volume adjustment method of the present embodiment.

Fig. 2 is a flow chart for use in explaining a sound volume adjustment method of the present embodiment.

At the reproduction of voice data from an application at the personal computer, the application 120 or 121 requests the operating system 100 to open a sound device of the personal computer (Step 201).

In the present embodiment, the sound volume adjustment control unit 130 provided between the applications 120 and 121 and the operating system 100 hooks the request for open (Step 202). Then, the sound volume adjustment control unit 130 requests the operating system 100 to open the sound device (Step 203).

Subsequently, the sound volume adjustment control

unit 130 obtains a handle for the sound device from the operating system 100 (Step 204). Furthermore, the sound volume adjustment control unit 130 refers to the memory 140 to determine whether the application which has made a request for open is already registered or not (Step 205).

Then, if the application is already registered, the unit 130 obtains sound volume setting information corresponding to the application. Here, the unit obtains a sound volume adjustment coefficient (volume value) as the sound volume setting information (Step 206).

Next, the sound volume adjustment control unit 130 issues the handle for the sound device to the application (Step 207).

Then, the application issues PCM data as voice data to the operating system 100 (Step 208).

In the present embodiment, the sound adjustment control unit 130 hooks the PCM data (Step 209). Then, the sound volume adjustment control unit 130 adjusts the sound volume data of the PCM data. At the adjustment, the unit 130 multiplies the sound volume data by the sound volume adjustment coefficient obtained at Step 206 to generate sound volume data having been adjusted.

Subsequently, the sound volume adjustment control unit 130 issues the sound volume data having been adjusted to the operating system 100. As a result, the voice data is reproduced based on the sound volume data

having been adjusted (Step 210).

On the other hand, when determination is made at the above Step 205 that the application is yet to be registered, the sound volume adjustment control unit 130 displays the sound volume adjustment function indication on the operation screen 150. Then, through the user's operation of the sound volume adjustment function indication, the sound volume setting information corresponding to a new application, that is, a sound volume adjustment coefficient, is set (Step 211).

Then, the new application and the new sound volume adjustment coefficient correlated to each other are registered in the memory 140 (Step 212).

These procedures enable automatic sound volume adjustment based on the registered sound volume setting information when voice data is transferred from the application again.

Although in the present embodiment described above, description has been made of an example where the present invention is structured under specific conditions, various modifications are possible. For example, in the above embodiment, although the present invention has been described with respect to a case where voice data is transferred from the two applications 120 and 121, the number of applications in the present invention is not limited thereto.

As described in detail in the foregoing, the

present invention enables automatic adjustment of sound
volume data based on sound volume setting information
registered including an application and a sound volume
adjustment coefficient correlated to each other. As a
5 result, simple sound volume adjustment operation
realizes reproduction of voice data in a level sound
volume appropriate for each application.

Although the invention has been illustrated and
described with respect to exemplary embodiment thereof,
10 it should be understood by those skilled in the art that
the foregoing and various other changes, omissions and
additions may be made therein and thereto, without
departing from the spirit and scope of the present
invention. Therefore, the present invention should not
15 be understood as limited to the specific embodiment set
out above but to include all possible embodiments which
can be embodied within a scope encompassed and
equivalents thereof with respect to the feature set out
in the appended claims.

WHAT IS CLAIMED IS:

1. A sound volume adjustment system for a personal computer, comprising:

a memory in which sound volume setting information set for each application is registered, and

5 sound volume adjustment control means for adjusting, for each application, sound volume data of voice data transferred from said application to an operating system based on said sound volume setting information to generate sound volume data having been
10 adjusted and transferring the sound volume data having been adjusted to the operating system.

2. The sound volume adjustment system for a personal computer according to claim 1, wherein

in said memory a sound volume adjustment coefficient is stored as said sound volume setting
5 information, and

said sound volume adjustment control means multiplies said sound volume data by said sound volume adjustment coefficient to generate said sound volume data having been adjusted.

10 3. The sound volume adjustment system for a personal computer according to claim 1, wherein

a sound volume level of said sound volume data

having been adjusted is set to be equivalent to that of
5 a sound volume of a system sound (error sound) generated
by said operating system.

4. The sound volume adjustment system for a personal
computer according to claim 1, wherein

in said memory a sound volume adjustment
coefficient is stored as said sound volume setting
5 information,

said sound volume adjustment control means
multiplies said sound volume data by said sound volume
adjustment coefficient to generate said sound volume
data having been adjusted, and

10 a sound volume level of said sound volume data
having been adjusted is set to be equivalent to that of
a sound volume of a system sound (error sound) generated
by said operating system.

5. The sound volume adjustment system for a personal
computer according to claim 1, wherein

when voice data is transferred from an
application for which sound volume setting information
5 is yet to be registered,

said sound volume adjustment control means
displays sound volume adjustment function indications on
an operation screen to register, in said memory, sound
volume setting information based on a sound volume set

10 by the operation through said sound volume adjustment
function indications so as to correspond to the
application.

6. The sound volume adjustment system for a personal
computer according to claim 1, wherein

in said memory a sound volume adjustment
coefficient is stored as said sound volume setting
5 information,

said sound volume adjustment control means
multiplies said sound volume data by said sound volume
adjustment coefficient to generate said sound volume
data having been adjusted, and

10 when voice data is transferred from an
application for which sound volume setting information
is yet to be registered,

said sound volume adjustment control means
displays sound volume adjustment function indications on
15 an operation screen to register, in said memory, sound
volume setting information based on a sound volume set
by the operation through said sound volume adjustment
function indications so as to correspond to the
application.

20

7. The sound volume adjustment system for a personal
computer according to claim 1, wherein

a sound volume level of said sound volume data

having been adjusted is set to be equivalent to that of
5 a sound volume of a system sound (error sound) generated
by said operating system, and

when voice data is transferred from an
application for which sound volume setting information
is yet to be registered,

10 said sound volume adjustment control means
displays sound volume adjustment function indications on
an operation screen to register, in said memory, sound
volume setting information based on a sound volume set
by the operation through said sound volume adjustment
15 function indications so as to correspond to the
application.

8. The sound volume adjustment system for a personal
computer according to claim 1, wherein

in said memory a sound volume adjustment
coefficient is stored as said sound volume setting
5 information,

said sound volume adjustment control means
multiplies said sound volume data by said sound volume
adjustment coefficient to generate said sound volume
data having been adjusted,

10 a sound volume level of said sound volume data
having been adjusted is set to be equivalent to that of
a sound volume of a system sound (error sound) generated
by said operating system,

when voice data is transferred from an
15 application for which sound volume setting information
is yet to be registered,

said sound volume adjustment control means
displays sound volume adjustment function indications on
an operation screen to register, in said memory, sound
20 volume setting information based on a sound volume set
by the operation through said sound volume adjustment
function indications so as to correspond to the
application.

9. A sound volume adjustment method for a personal
computer, comprising the steps of:

registering sound volume setting information set
for each application,

5 adjusting, for each application, sound volume
data of voice data transferred from the application to
an operating system based on said sound volume setting
information to generate sound volume data having been
adjusted, and

10 transferring said sound volume data having been
adjusted to the operating system.

10. The sound volume adjustment method for a personal
computer according to claim 9, wherein

a sound volume adjustment coefficient is
registered as said sound volume setting information, and

5 said sound volume data is multiplied by said
sound volume adjustment coefficient to generate said
sound volume data having been adjusted.

11. The sound volume adjustment method for a personal
computer according to claim 9, wherein

5 a sound volume level of said sound volume data
having been adjusted is set to be equivalent to that of
a sound volume of a system sound (error sound) generated
by said operating system.

12. The sound volume adjustment method for a personal
computer according to claim 9, wherein

 a sound volume adjustment coefficient is stored
as said sound volume setting information,

5 said sound volume data is multiplied by said
sound volume adjustment coefficient to generate said
sound volume data having been adjusted, and

 a sound volume level of said sound volume data
having been adjusted is set to be equivalent to that of
10 a sound volume of a system sound (error sound) generated
by said operating system.

13. The sound volume adjustment method for a personal
computer according to claim 9, wherein

 when voice data is transferred from an
application for which sound volume setting information

5 is yet to be registered, sound volume setting
information based on a set sound volume is registered in
said memory so as to correspond to the application.

14. The sound volume adjustment method for a personal
computer according to claim 9, wherein

a sound volume adjustment coefficient is stored
as said sound volume setting information,

5 said sound volume data is multiplied by said
sound volume adjustment coefficient to generate said
sound volume data having been adjusted, and

when voice data is transferred from an
application for which sound volume setting information
10 is yet to be registered, sound volume setting
information based on a set sound volume is registered in
said memory so as to correspond to the application.

15. The sound volume adjustment method for a personal
computer according to claim 9, wherein

a sound volume level of said sound volume data
having been adjusted is set to be equivalent to that of
5 a sound volume of a system sound (error sound) generated
by said operating system, and

when voice data is transferred from an
application for which sound volume setting information
is yet to be registered, sound volume setting
10 information based on a set sound volume is registered in

said memory so as to correspond to the application.

16. The sound volume adjustment method for a personal computer according to claim 9, wherein

a sound volume adjustment coefficient is stored as said sound volume setting information,

5 said sound volume data is multiplied by said sound volume adjustment coefficient to generate said sound volume data having been adjusted,

10 a sound volume level of said sound volume data having been adjusted is set to be equivalent to that of a sound volume of a system sound (error sound) generated by said operating system, and

15 when voice data is transferred from an application for which sound volume setting information is yet to be registered, sound volume setting information based on a set sound volume is registered in said memory so as to correspond to the application.

17. A computer readable memory storing a sound volume adjustment program for controlling a personal computer to conduct sound volume adjustment,

5 said sound volume adjustment program comprising the steps of:

registering sound volume setting information set for each application,

adjusting, for each application, sound volume

data of voice data transferred from the application to
10 an operating system based on said sound volume setting
information to generate sound volume data having been
adjusted, and

transferring said sound volume data having been
adjusted to the operating system.

15

18. The computer readable memory storing a sound
volume adjustment program for controlling a personal
computer to conduct sound volume adjustment according to
claim 17, wherein

5 a sound volume adjustment coefficient is
registered as said sound volume setting information, and

said sound volume data is multiplied by said
sound volume adjustment coefficient to generate said
sound volume data having been adjusted.

10

19. The computer readable memory storing a sound
volume adjustment program for controlling a personal
computer to conduct sound volume adjustment according to
claim 17, wherein

5 a sound volume level of said sound volume data
having been adjusted is set to be equivalent to that of
a sound volume of a system sound (error sound) generated
by said operating system.

20. The computer readable memory storing a sound

volume adjustment program for controlling a personal computer to conduct sound volume adjustment according to claim 17, wherein

5 a sound volume adjustment coefficient is stored as said sound volume setting information,

 said sound volume data is multiplied by said sound volume adjustment coefficient to generate said sound volume data having been adjusted, and

10 a sound volume level of said sound volume data having been adjusted is set to be equivalent to that of a sound volume of a system sound (error sound) generated by said operating system.

21. The computer readable memory storing a sound volume adjustment program for controlling a personal computer to conduct sound volume adjustment according to claim 17, wherein

5 when voice data is transferred from an application for which sound volume setting information is yet to be registered,

 sound volume setting information based on a set sound volume is registered in said memory so as to
10 correspond to the application.

22. The computer readable memory storing a sound volume adjustment program for controlling a personal computer to conduct sound volume adjustment according to

claim 17, wherein

5 a sound volume adjustment coefficient is stored
as said sound volume setting information,

 said sound volume data is multiplied by said
sound volume adjustment coefficient to generate said
sound volume data having been adjusted, and

10 when voice data is transferred from an
application for which sound volume setting information
is yet to be registered,

 sound volume setting information based on a set
sound volume is registered in said memory so as to
15 correspond to the application.

23. The computer readable memory which storing a
sound volume adjustment program for controlling a
personal computer to conduct sound volume adjustment
according to claim 17, wherein

5 a sound volume adjustment coefficient is stored
as said sound volume setting information,

 said sound volume data is multiplied by said
sound volume adjustment coefficient to generate said
sound volume data having been adjusted,

10 a sound volume level of said sound volume data
having been adjusted is set to be equivalent to that of
a sound volume of a system sound (error sound) generated
by said operating system, and

 when voice data is transferred from an

15 application for which sound volume setting information
is yet to be registered,

sound volume setting information based on a set
sound volume is registered in said memory so as to
correspond to the application.

ABSTRACT OF THE DISCLOSURE

The sound volume adjustment system for a personal computer includes a memory in which sound volume setting information set for each application is registered, and
5 a sound volume adjustment control unit for adjusting, for each application, sound volume data of voice data transferred from the application to an operating system based on said sound volume setting information to generate sound volume data having been adjusted and
10 transferrring the sound volume data having been adjusted to the operating system.

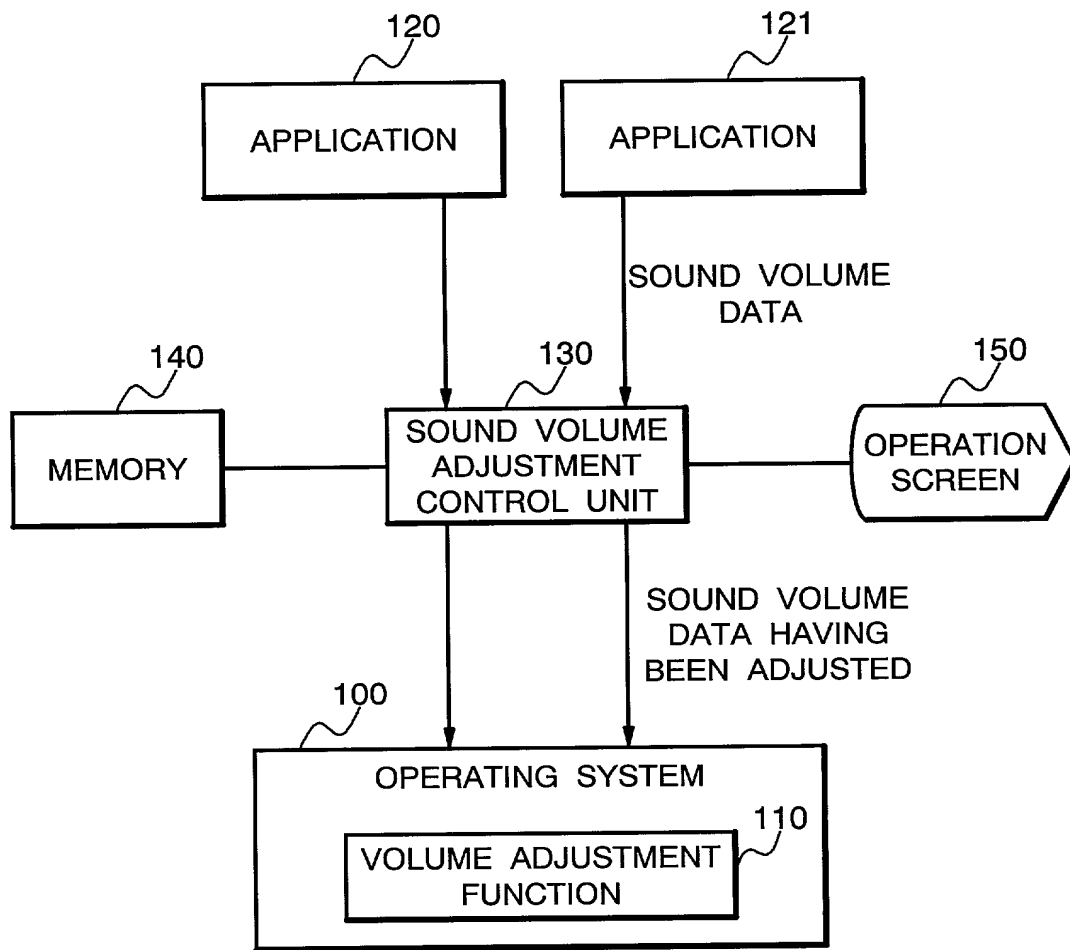
FIG. 1

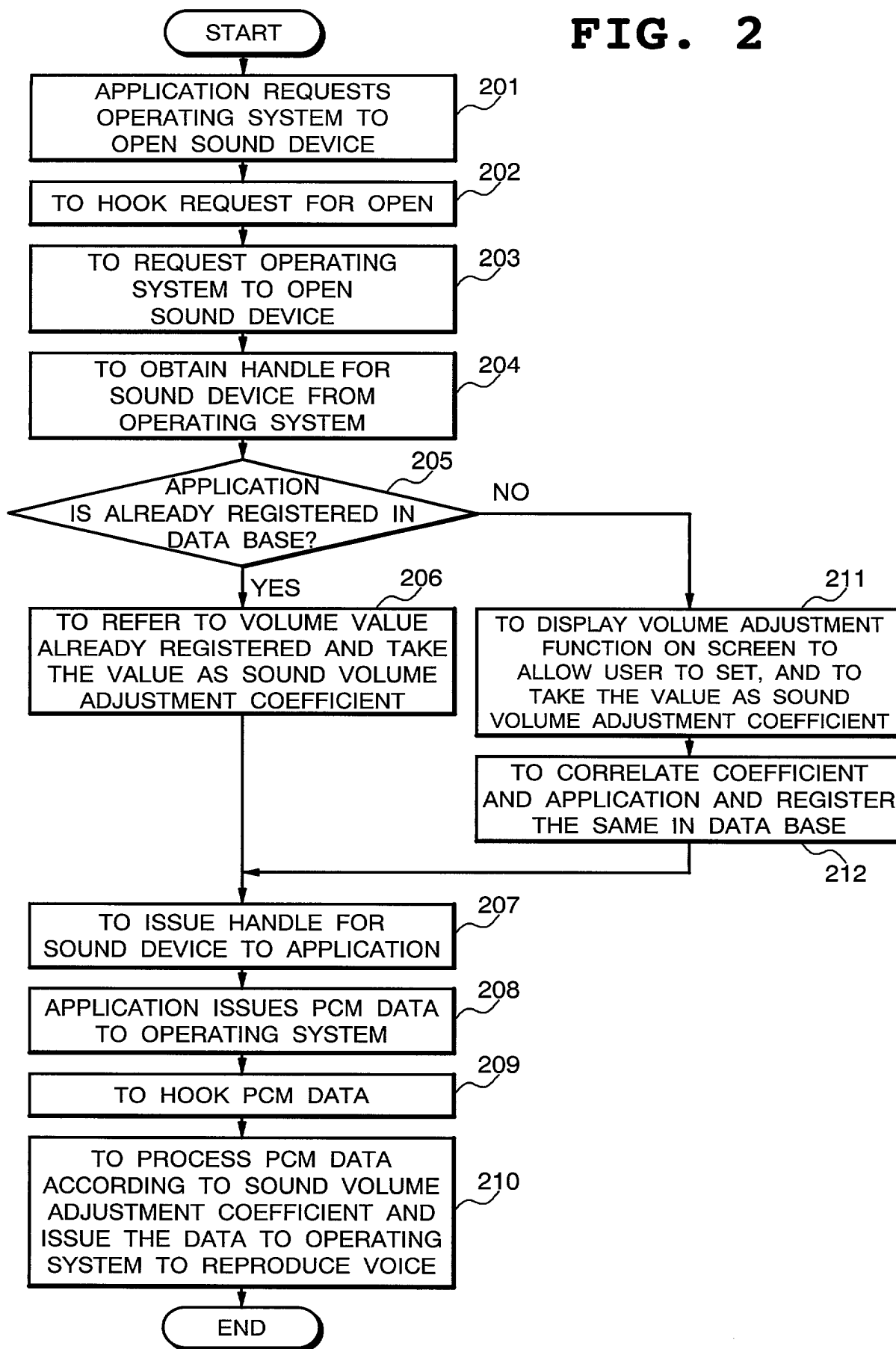
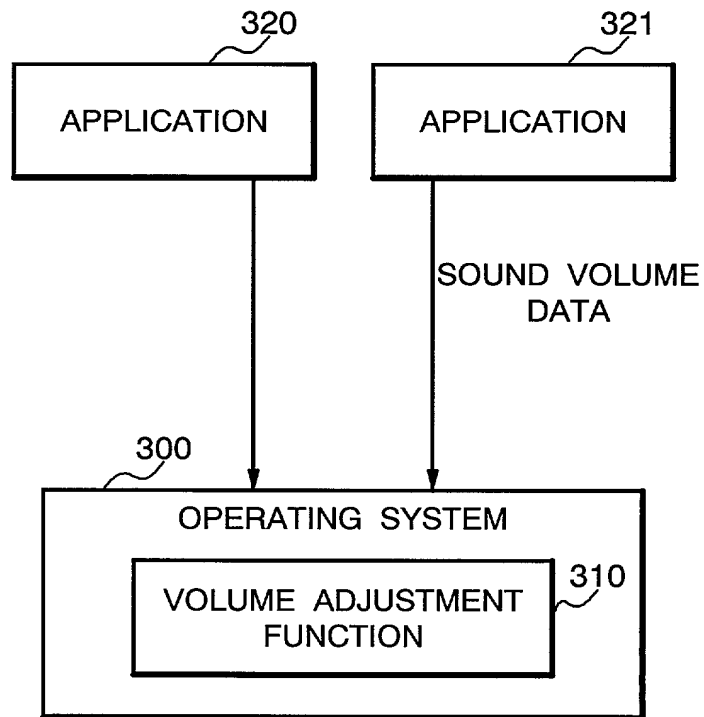
FIG. 2

FIG. 3 (PRIOR ART)

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**SOUND VOLUME ADJUSTMENT SYSTEM IN PERSONAL COMPUTER AND
SOUND VOLUME ADJUSTMENT METHOD THEREOF**

the specification of which is attached hereto unless the following box is checked:

☐ was filed on _____ as United States Application Number or PCT International Application Number _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is known by me to be material to patentability as defined in Title 37, Code of Federal Regulations § 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed:

PRIOR FOREIGN APPLICATION(S)

NUMBER	COUNTRY	DAY/MONTH/YEAR FILED	PRIORITY CLAIMED
11-212325	Japan	27/July/1999	Yes

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below.

APPLICATION NO.	FILING DATE


I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is known by me to be material to patentability as defined in Title 37, Code of Federal Regulations § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

APPLICATION SERIAL NO.	FILING DATE	STATUS: PATENTED, PENDING, ABANDONED

I hereby appoint as my attorneys, with full powers of substitution and revocation, to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: Stephen A. Bent, Reg. No. 29,768; David A. Blumenthal, Reg. No. 26,257; John J. Feldhaus, Reg. No. 28,822; Donald D. Jeffery, Reg. No. 19,980; Eugene M. Lee, Reg. No. 32,039; Peter G. Mack, Reg. No. 26,001; Brian J. McNamara, Reg. No. 32,789; Sybil Meloy, Reg. No. 22,749; George E. Quillin, Reg. No. 32,792; Colin G. Sandercock, Reg. No. 31,298; Bernhard D. Saxe, Reg. No. 28,665; Charles F. Schill, Reg. No. 27,590; Richard L. Schwaab, Reg. No. 25,479; Arthur Schwartz, Reg. No. 22,115; Harold C. Wegner, Reg. No. 25,258.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Residence Address	Country of Citizenship	
Post Office Address		

Full Name of Fifth Inventor	Signature of Fifth Inventor	Date
Residence Address	Country of Citizenship	
Post Office Address		